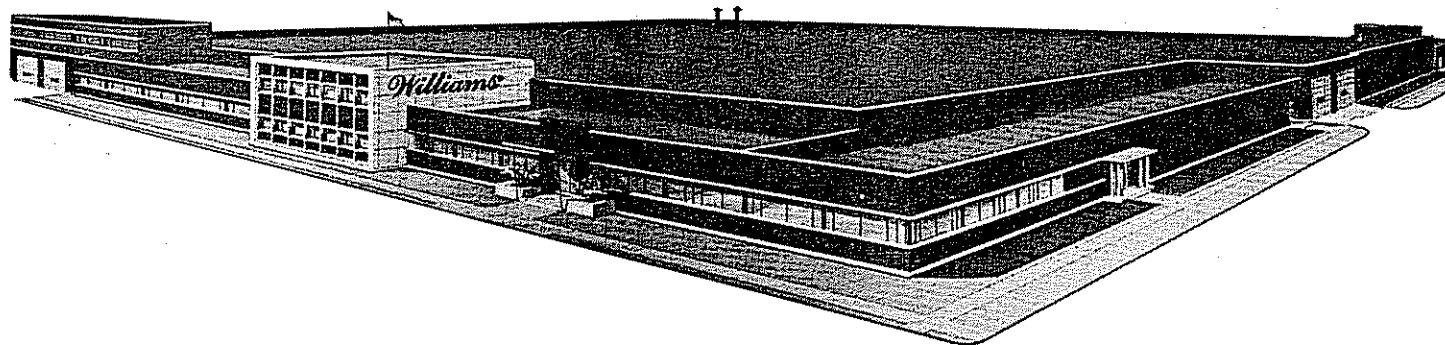


Instruction Manual

for

MISS O



Williams[®] ELECTRONICS, INC.
SUBSIDIARY OF THE SEEBURG CORPORATION

3401 N. California Ave.
Phone 267-2240

Chicago, Ill. 60618, U.S.A.
Cable Address: Wilcoin

IMPORTANT NOTICE

**KINDLY INFORM LOCATIONS THAT THEY
CAN TURN DISPLAY LIGHTS ON BY PRESSING
LEFT FLIPPER BUTTON. MACHINE CAN STILL
BE SHUT OFF BY TAPPING BOTTOM OF
CABINET.**

**MASTER SWITCH (ON-OFF) IS LOCATED
UNDERNEATH FRONT PART OF CABINET.**

CAUTION!

The playboard on this machine has an improved finish with excellent wearing properties. Do not under any circumstances clean the board with water, water soap solutions or harsh abrasives. Avoid such things as steel wool, kitchen cleansers or abrasive hand soap. Water will weaken the adhering of the paint to the board and abrasives shorten the board life by many thousand plays. A wax base cleaner with negligible abrasive qualities used lightly, but frequently, will extend the board life to its full capabilities.

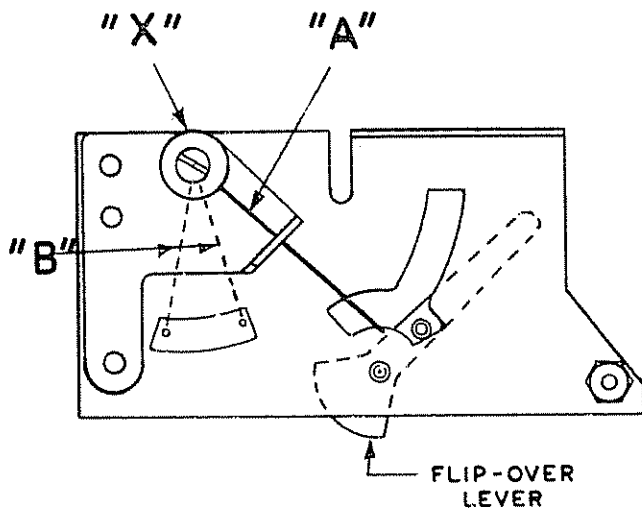
SERVICEMAN TO REMOVE BACKGLASS:

- WITH BACK DOOR REMOVED, PULL BACK ON BRACKETS AT INSIDE TOP OF LITE BOX.**
- FROM THE FRONT OF GAME, LIFT GLASS UP AND OUT.**

INSTRUCTIONS FOR ALTERING COIN CHUTES EQUIPPED WITH A FLIP-OVER DEVICE.

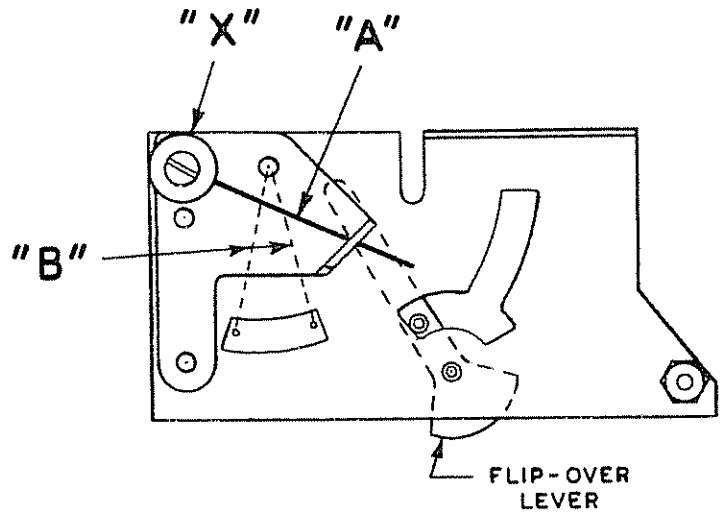
FOR 1 COIN - FOR 1 PLAY

FIGURE 1



OR 2 COINS - FOR 1 PLAY

FIGURE 2



1 COIN - FOR 1 PLAY (FIGURE 1):

Wire form "A" should be in position as shown in Figure 1. Flip-over lever should rebound from wire form "A" and return to position shown in Figure 1 everytime a coin is inserted. All coins pass over the coin trip switch wire "B".

2 COINS - FOR 1 PLAY (FIGURE 2):

Wire form "A" should be in position as shown in Figure 2 (see note). Flip-over lever should alternate from side to side. 1st coin should go to cash box without actuating coin trip switch wire "B", 2nd coin should pass the coin trip switch wire "B" and returns flip-over to position as shown in Figure 2.

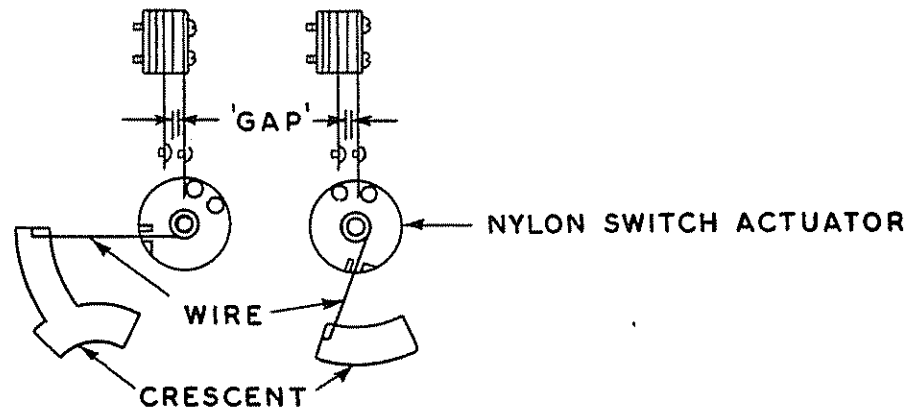
NOTE:

To change from 1 coin play to 2 coin play or vice versa - loosen screw "X" and move screw, bushing & wire form "A" to position as required - shown in Figure 1 position as required - shown in Figure 1 or Figure 2.

When using 1 coin for 1 play, wire form "A" should not under any circumstances be allowed to enter the "Banana" slot and cause binding of flip-over lever.

INSTRUCTIONS FOR COIN TRIP SWITCH ADJUSTMENT

WIRE SHOULD BE IN CONTACT WITH END OF CRESCENT OPENING WHEN BLADE ADJUSTMENT IS MADE.



Long blade should be in contact with nylon switch actuator and have a maximum overtravel of $1/32$.

or

Using a gram gauge, tension of long blade should not exceed 10 grams.

SWITCH ADJUSTMENT

1. For small coins, such as dimes, adjust short blade so that the 'gap' between the silver contacts is .045 to .055.
2. For larger & heavier coins the 'gap' should be .045 to .060.
3. Do not adjust 'gap' closer than .040.

WARRANTY

THE MOTORS IN ALL NEW WILLIAMS PRODUCTS ARE UN-CONDITIONALLY GUARANTEED FOR 6 MONTHS FROM DATE OF PURCHASE.

ANY DEFECTIVE MOTORS RETURNED DURING THE WARRANTY PERIOD WILL BE REPLACED FREE OF CHARGE BY YOUR WILLIAMS DISTRIBUTOR.

IMPORTANT NOTICE

WHEN ORDERING PARTS ALWAYS SPECIFY NAME OF UNIT, GAME AND SERIAL NUMBER, IN ADDITION TO A CLEAR DESCRIPTION OF THE PART AND PART NUMBER IF POSSIBLE.

UNIT PARTS LIST "MISS O"

UNIT NAME	CONTACT DISC	WIPER ASSEMBLY	RATCHET GEAR ASSEMBLY	MOTORS
REPLAY	-----	-----	A-6400	
BALL COUNT	C-6932	C-6520	A-6402-5	
ADVANCE	C-6417	C-6520	A-6404-15	
NO. MATCH	C-6879	C-6520	A-6401	14A-7805 (60 CYCLE)
0-9	B-6297	A-6294	3C-7128	14A-7806 (60 CYCLE)
TENS	----	----	3C-7128	
HUNDREDS	B-6297	A-6294	3C-7128	
THOUSANDS	B-6297	A-6294	3C-7128	

"MISS O" COIL CHART

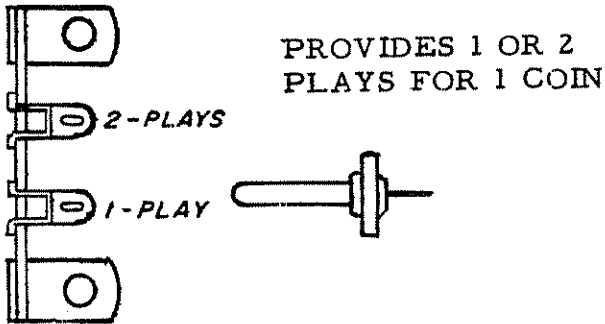
NOTICE:

THIS GAME OPERATES ON 24 VOLTS. WHEN ORDERING REPLACEMENT TRANSFORMERS, MOTORS, COILS OR METERS.... MAKE SURE TO SPECIFY CORRECT PART NUMBER.

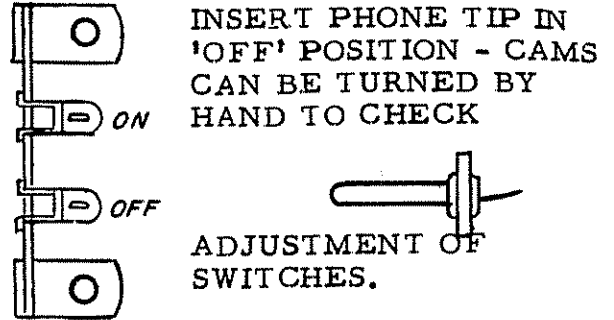
NUMBER	DESCRIPTION	LOCATION
14 A 7805	SCORE MOTOR - 60 CYCLE	MECH. PANEL
14 A 7806	SCORE MOTOR - 50 CYCLE	MECH. PANEL
15 A 6771	TRANSFORMER - 60 CYCLE	MECH. PANEL
15 A 6773	TRANSFORMER - 50 CYCLE	MECH. PANEL
B 6396	24 VOLT METER	MECH. PANEL
<u>SOLENOID COILS</u>		
A 22-550	MATCH UNIT STEP UP BALL COUNT UNIT STEP UP BALL RELEASE ADVANCE UNIT	INSERT INSERT PLAYFIELD PLAYFIELD
A 23-600	REPLAY UNIT STEP UP	INSERT
A2-23-750	LARGE BELL KNOCKER	CABINET CABINET
B 26-800	BALL COUNT UNIT RESET REPLAY UNIT RESET SCORE DRUM UNITS ... (4 req'd.) ADVANCE UNIT RESET	INSERT INSERT INSERT PLAYFIELD
G 22-550	JET BUMPERS ... (4 req'd.)	PLAYFIELD
G 23-600	EJECT ... (2 req'd.)	PLAYFIELD
G 23-750	AUTO-KICKERS ... (2 req'd.)	PLAYFIELD
FL 21-375/ 28-400	FLIPPERS ... (2 req'd.)	PLAYFIELD
<u>RELAY COILS</u>		
M 25-400	500 RELAY (TRIP)	PLAYFIELD
M 29-1000	GAME OVER (TRIP)	MECH. PANEL
M 29-1100	NO. 1 BUMPER NO. 2 BUMPER NO. 3 BUMPER TARGET ADVANCE 1 POINT 10 POINT 100 POINT 10¢ 25¢ MYSTERY ADVANCE 500 (LATCH)	PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD INSERT INSERT INSERT MECH. PANEL MECH. PANEL PLAYFIELD PLAYFIELD
M 1-31-1500	COIN LOCKOUT	DOOR
Z 27-1000	OUTHOLE RESET COIN GAME OVER (LATCH) EJECT	MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL
Z 28-1150	LOCK BALL INDEX EXTRA BALL A RELAY B RELAY C RELAY D RELAY CHANGE	MECH. PANEL MECH. PANEL MECH. PANEL PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD

ADJUSTMENTS ON MECHANISM PANEL

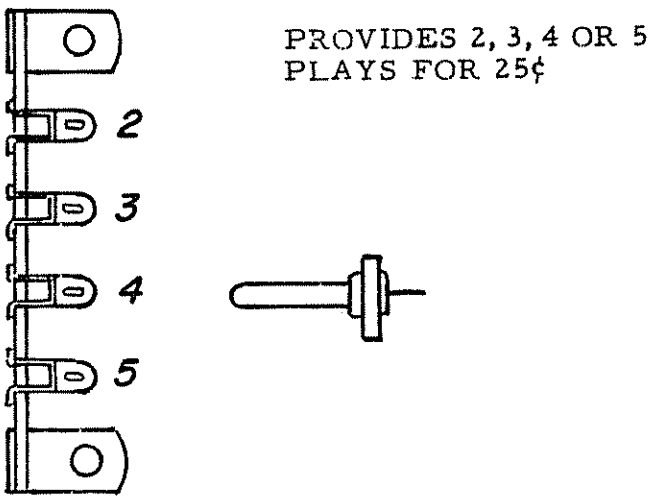
10¢ Adjustment



Motor Service Jack

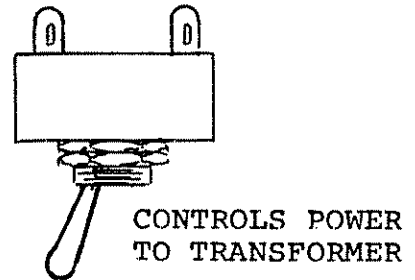


25¢ Adjustment

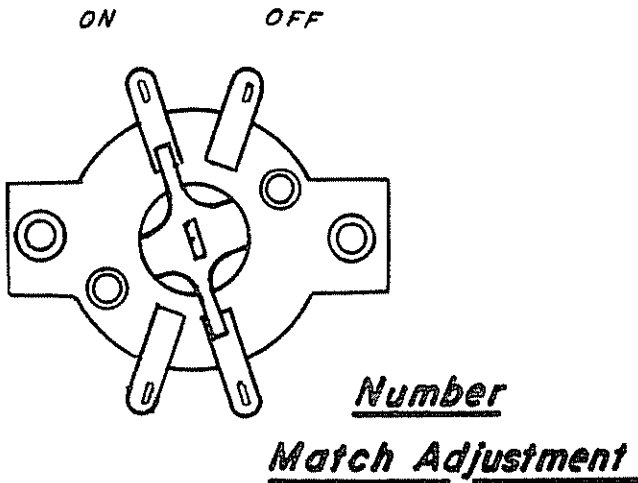


MASTER ON-OFF SW.

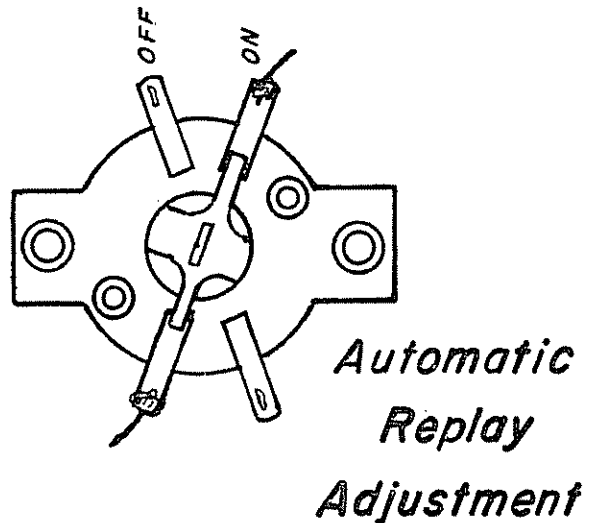
(Located under front of
Cabinet)



ADJUSTMENTS IN BACKBOX

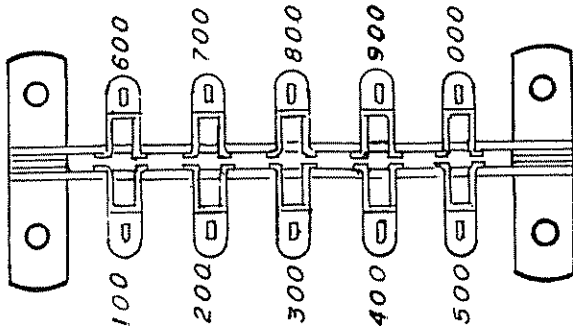


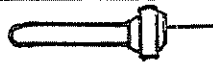

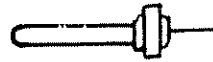





In "ON" position, number match lite will appear when game is over. This number will match the last number in point score, on the average, once every ten games. In "OFF" position, Number Match is inoperative.



IN "ON" POSITION, A REPLAY IS AWARDED WHEN 15th BALL IS MADE.

ADJUSTMENTS IN BACKBOX



-  -RED- (1100 to 2000)
-  -BLUE- (2100 to 3000)
-  -YELLOW- (3100 to 4000)
-  -GREEN- (4100 to 5000)
-  -WHITE- (5100 to 6000)
-  -BROWN- (6100 to 7000)
-  -ORANGE- (7100 to 8000)
-  -BLACK- (8100 to 9000)

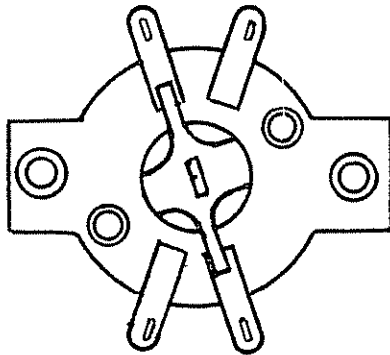
Hi-Score Adjustment

Insert plugs into 10 Point Female at desired positions.

Examples:

- Yellow wire into 300 position scores at 3300.
- Yellow wire into 000 position scores at 4000.

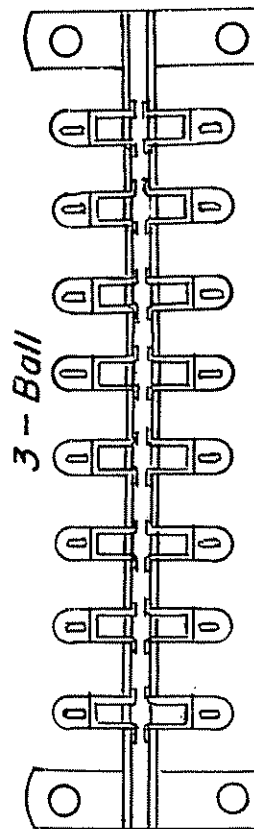
Lib. Cons.



Bottom Rollover Adjustment

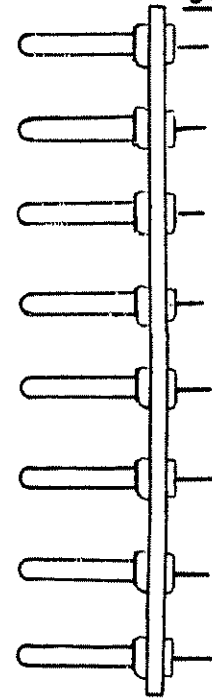
IN LIBERAL POSITION, BOTH ROLLOVER LANES LIFE FOR REPLAY AFTER 15 BALLS ARE MADE.

IN CONSERVATIVE POSITION, BOTTOM ROLLOVER LANES LIFE ALTERNATELY FOR REPLAY AFTER 15 BALLS ARE MADE.



5-Ball

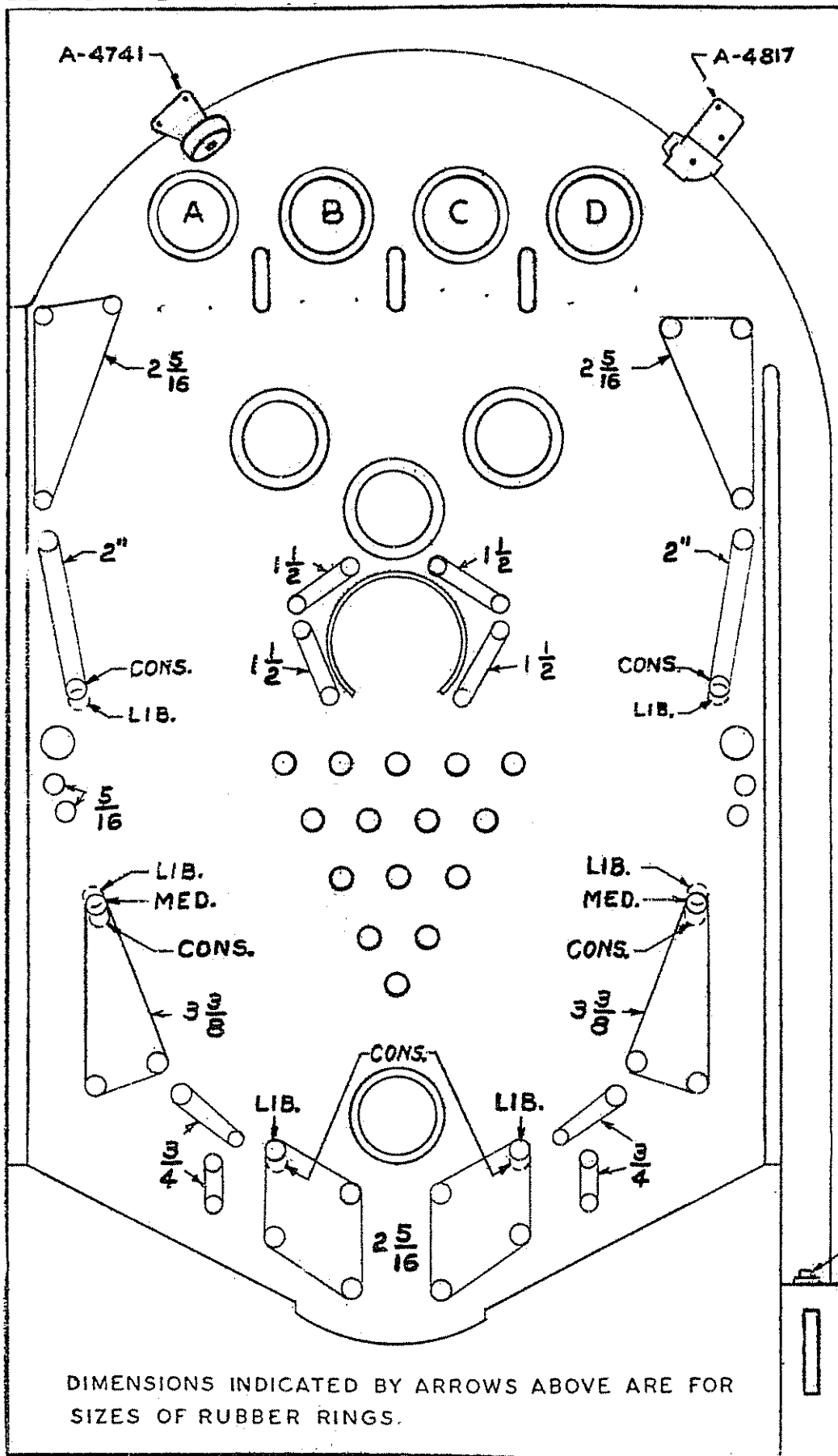
3-5 Ball Adj. Jack



THIS JACK CHANGES 3 BALL TO 5 BALL PLAY OR VICE VERSA.

"MISS-O" POST ADJUSTMENT SHEET

TO MAKE GAME MORE "CONSERVATIVE" OR "LIBERAL"-MOVE POSTS $\frac{3}{16}$ " AS SHOWN IN SKETCH BELOW. SPOTTING HOLES ARE PROVIDED AND CAN BE SEEN ON REMOVAL OF POSTS.



ABBREVIATIONS:

CONS.- CONSERVATIVE
LIB.- LIBERAL

RUBBER RING NUMBERS:

23A- 6300	5/16" I.D.
23A-6301	3/4" I.D.
23A-6304	1 1/2" I.D.
23A-6305	2" I.D.
23A-6306	2 5/16" I.D.
23A-6308	3 3/8" I.D.

A-4741 REBOUND ASS'Y.
A-4817 BALL GATE ASS'Y.

23A-6327- BALL SHOOTER
RUBBER TIP

DIMENSIONS INDICATED BY ARROWS ABOVE ARE FOR SIZES OF RUBBER RINGS.

"MISS O" OPERATES AS FOLLOWS:

FOUR TOP TARGETS, A,B,C AND D, LITE CORRESPONDING TOP BUMPERS. LITING ALL FOUR TOP BUMPERS WILL LITE CENTER HORSESHOE. BALL GOING THRU CENTER HORSESHOE, WHEN LIT, WILL ENERGIZE EXTRA BALL RELAY.

TOP TARGET "A" WILL ALSO LITE TWO TOP JET BUMPERS FOR 10 SCORING

TOP TARGET "D" WILL ALSO LITE BOTTOM JET BUMPER FOR 10 SCORING.

THE 15 PLAYFIELD BALL LITES ARE CONTROLLED BY ADVANCE UNIT. THIS UNIT WILL ADVANCE ONE STEP BY HITTING CENTER TARGET, WHEN LIT. IT ADVANCES TWO STEPS WHEN MAKING TOP CENTER OR BOTTOM CENTER ROLLOVER. BALL IN LEFT OR RIGHT EJECT HOLE, WHEN LIT, WILL ADVANCE THE UNIT 1, 2, 3 OR 5 STEPS (DEPENDING ON THE POSITION OF NUMBER MATCH UNIT).

STEPPING UP THE ADVANCE UNIT 15 TIMES WILL LITE LEFT AND RIGHT BOTTOM ROLLOVERS FOR REPLAY.

POWER TRANSFORMER:

LOCATED ON MECHANISM PANEL, IT IS EQUIPPED WITH A SECONDARY TAP. IF YOUR GAME IS ON LOCATION WITH EXTREMELY LOW LINE VOLTAGE, REMOVE LEAD FROM LUG MARKED 24 VOLTS AND SOLDER TO ALTERNATE LUG MARKED "HIGH". THIS WILL BOOST SECONDARY VOLTAGE APPROXIMATELY 2-3 VOLTS.

LEG LEVELERS:

ARE PROVIDED FOR TWO PURPOSES - 1st TO LEVEL GAME ON LOCATION, 2nd TO INCREASE PITCH FOR GAME PERCENTAGING. IF IT IS DESIRED TO SPEED UP PLAY AND DECREASE SCORES, RAISE REAR LEG LEVELERS TO INCREASE PITCH.

SUGGESTED SCORE CARDS:

5 BALL PLAY..... 356-1
3 BALL PLAY..... 356-2

1. GENERAL

NEVER EXPERIMENT with any of the mechanism. Locate any trouble with the aid of Wiring Diagrams or Operating & Servicing Information supplied with the machine, then check for proper adjustment of the units involved before making any changes. Improper adjustment or make-shift repair will only cause serious damage to other parts of the machine or repeated failure of the part.

NOTE: Always look for a possible loose wire, bad connection at a plug and socket, broken or unhooked springs on step-up units, relays, etc., before adjustments are made or wires reconnected.

2. FUSES

IMPORTANT: Never replace fuses with any rating other than specified on the fuse block; this block is located adjacent to the transformer.

3. LUBRICATION

Over-lubrication causes far more trouble in coin operated equipment than under-lubrication. Practically all cases of poor contact on switches and wiper discs are due to oil or grease, or oil vapor, which forms a film or residue on the contacts and will not allow current to pass through. Excess lubricant may also seep into clutches causing them to slip.

IMPORTANT: NEVER USE VASELINE FOR LUBRICATION OF ANY PART OF THE MACHINE. Vaseline is not a true lubricant. It leaves a dirty and gummy residue and it becomes very thick when cold. A special Coin Machine Lubricant is supplied with each machine.

STEP-UP Levers, Ratchets, Cams, Shafts and other sliding or oscillating parts should be very lightly greased with special Coin Machine Lubricant (supplied with machine) not oftener than every six months. The bakelite discs (biscuits) on the Motor Units and Step-up Units will require lubrication with the special Coin Machine Lubricant only after the grease is completely evaporated (3 to 12 months, depending on climate) or when the film of grease becomes dirty. In either event, clean the parts thoroughly with a solvent, then apply an extremely thin coat of the special grease.

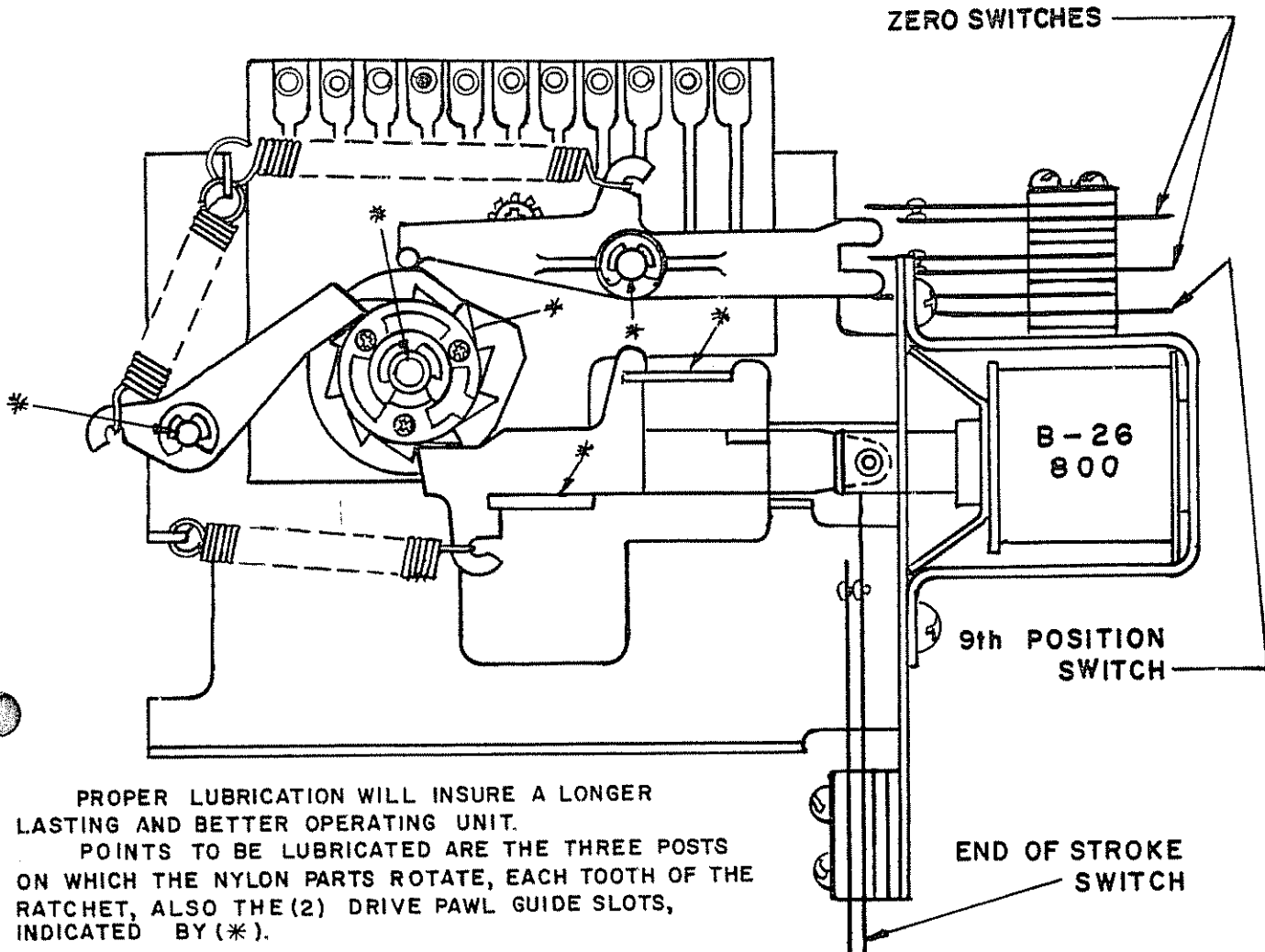
Solenoid Plungers should not have a lubricant of any kind. Should there be a sluggish tendency or if plungers are sticking, the parts should be cleaned with a solvent and flaked graphite applied on reassembly.

4. RELAY and SWITCH ADJUSTMENT

Where relay adjustments are called for, before bending blades, in all cases, on any machine, make certain that the screws holding the switch stacks are down very tightly. This is suggested because the plastic spacers in the switch stacks have occasionally shrunk by drying out, causing a poor adjustment.

SCORE DRUM UNIT

WITH PRINTED CIRCUIT AND CONTACT RING



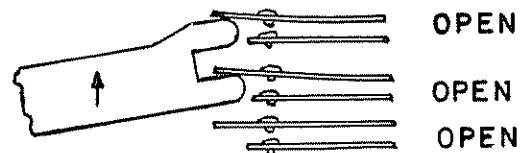
PROPER LUBRICATION WILL INSURE A LONGER LASTING AND BETTER OPERATING UNIT.

POINTS TO BE LUBRICATED ARE THE THREE POSTS ON WHICH THE NYLON PARTS ROTATE, EACH TOOTH OF THE RATCHET, ALSO THE (2) DRIVE PAWL GUIDE SLOTS, INDICATED BY (*).

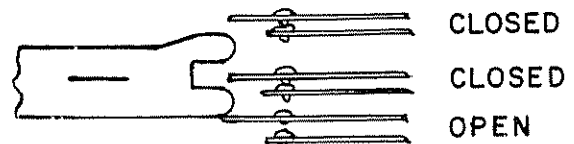
LUBRICATION: DO NOT PUT LUBRICANT ON DRIVE ARMATURE

SWITCH ADJUSTMENT

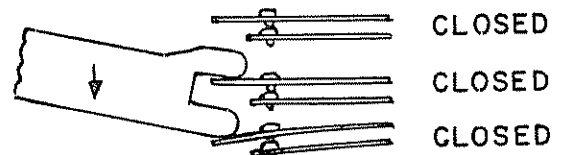
AT "0" OR INDEX POSITION ALL SWITCHES ARE OPEN AS SHOWN.



AT 1st. TO 8th. POSITION TOP SWITCHES ARE CLOSED—BOTTOM SWITCH REMAINS OPEN.



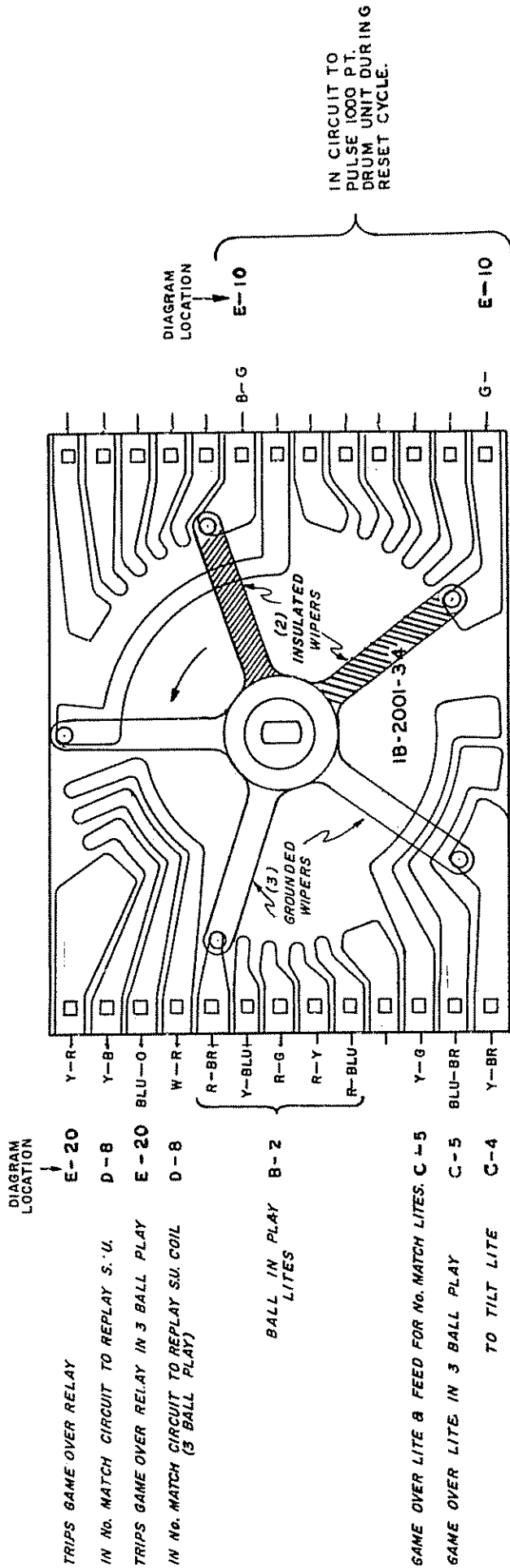
AT 9th POSITION ALL SWITCHES ARE CLOSED AS SHOWN



BALL COUNT S.U. UNIT

THIS UNIT RESETS AT THE START OF A NEW GAME. IT ADVANCES ONE STEP EACH TIME THE BALL LEAVES THE PLAYFIELD.

View looking at WIPER FINGER SIDE with wiper in ZERO OR RESET position



ADVANCE S.U. UNIT DISC

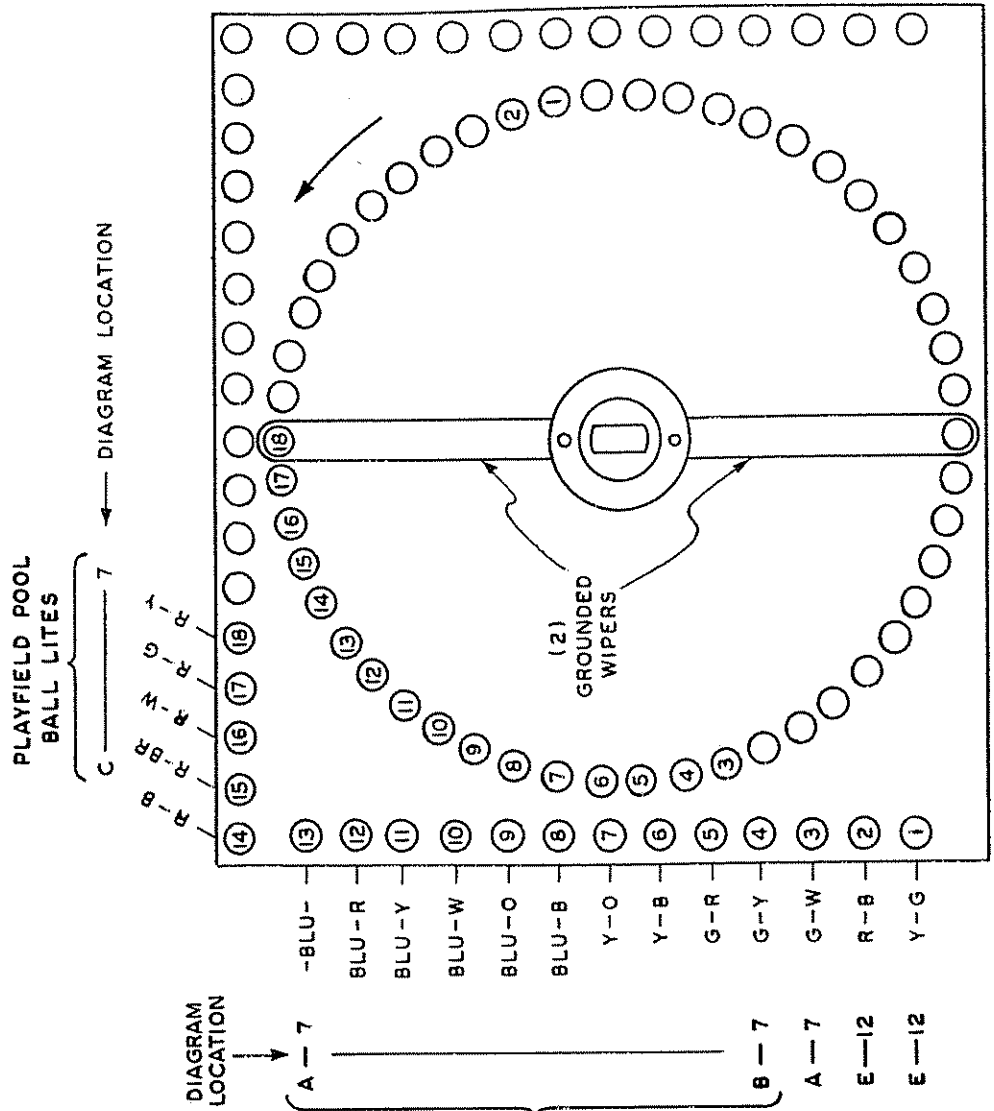
THIS UNIT RESETS COMPLETELY WHEN COIN RELAY IS ENERGIZED AND SCORE MOTOR CAM SWITCH 1A MAKES.

THE UNIT ADVANCES ONE STEP IF CENTER TARGET IS HIT WHEN LIT — TWO STEPS WHEN MAKING TOP CENTER OR BOTTOM CENTER ROLLOVER — AND TWO, THREE, OR FIVE STEPS (DEPENDING ON POSITION OF NUMBER MATCH UNIT) BY MAKING LEFT OR RIGHT EJECT SWITCH WHEN LIT.

VIEW LOOKING AT WIPER
FINGERS SIDE, WITH WIPER
IN ZERO POSITION.

(15)

PLAYFIELD POOL
BALL LITES



TO LEFT OR RIGHT BOTTOM R.O. "SPECIAL" LITES.

IN CIRCUIT TO REPLAY S.U. COIL, THRU SW. "C" ON CHANGE RELAY.

TO "AUTOMATIC REPLAY" ADJ. JACK.

No. MATCH UNIT

THIS UNIT ADVANCES ONE STEP EACH TIME THE ONE POINT RELAY IS PULSED.

View looking at
WIPER FINGER side

ENERGIZES CHANGE RELAY
FEEDS 0-BLU

IN NO. MATCH CIRCUIT.
THESE WIRES COME FROM
THE 1-PT. D.U. DISC.

DIAGRAM
LOCATION

0-BLU D-19
Y-D-19

-3 -8 -2 -5 -9 -4 -0 -6 -1 -7 NO. MATCH

DIAGRAM
LOCATION

F-8
NO. MATCH
FEED TO
REPLAY S.U.

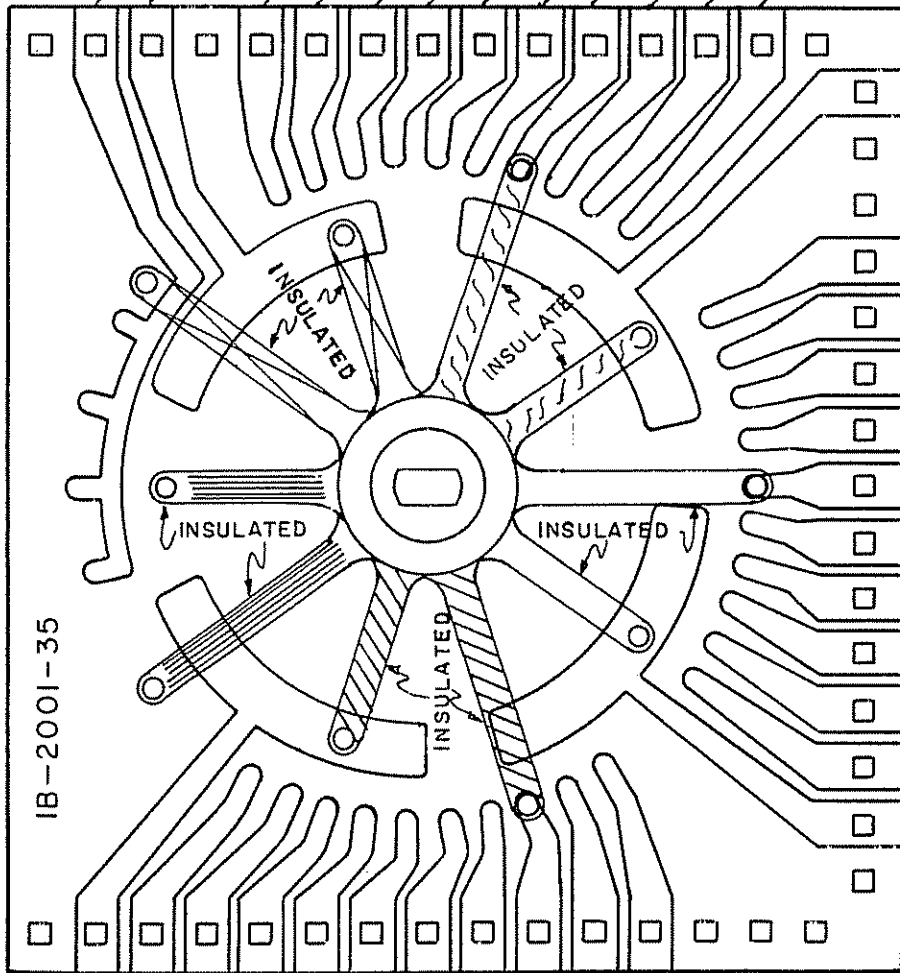


DIAGRAM LOCATION

F-8
NO. MATCH
FEED TO
REPLAY S.U.

W-GREY -2
W-B -5
W-O -9
W-BR -4
W-G B-3 -0
BR-W B-4 -6
BR-G -1
BR-Y -7
BR-BLU -3
BR-R -8
BR-O B-3

NO. MATCH LITES

B-3 FEED TO No. MATCH LITES

W-G (D-13)
IN HOLD
CIRCUIT TO
MYSTERY
ADVANCE RE.

R-BR (D-13)
TO SCORE MOTOR
CAM SW. 5A

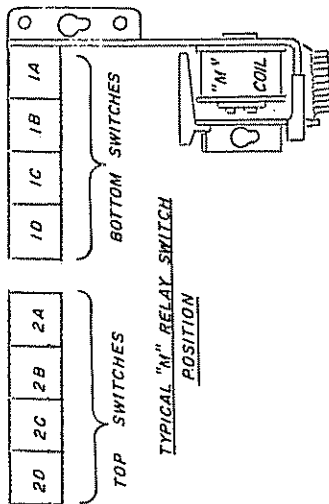
BLU-B (D-13)
TO SCORE MOTOR
CAM SW. 2A

W-B (D-13)
TO SCORE MOTOR
CAM SW. 1C

BR-B (D-13)
TO SCORE MOTOR
CAM SW. 3A

A.C. RELAYS & SWITCHES

On Mechanism Panel

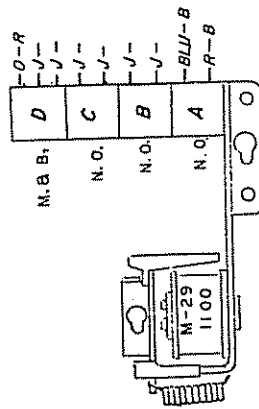


OPERATION

DIAGRAM LOCATION

10¢ RELAY

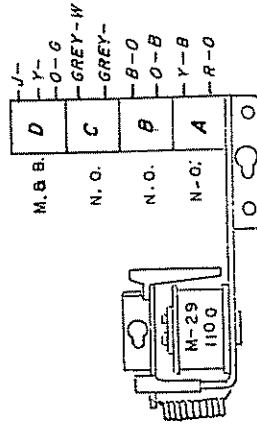
IS ENERGIZED BY 10¢ COIN SWITCH, IF 10¢ ADJUSTMENT JACK IS IN "2 PLAYS" POSITION.



IN CIRCUIT TO KNOCKER COIL--ALSO RUNS SCORE MOTOR.
 PULSES REPLAY S.U. COIL, THRU IMPULSE CAM SWITCH A.
 ENERGIZES LOCK RELAY.
 IN HOLD CIRCUIT TO THIS RELAY.

25¢ RELAY

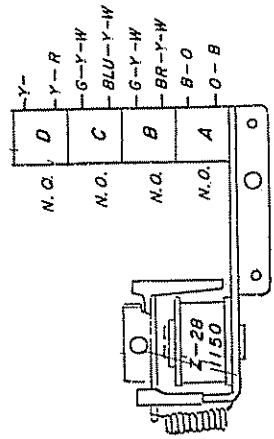
IS ENERGIZED BY 25¢ COIN SWITCH.



IN CIRCUIT TO KNOCKER COIL--ALSO RUNS SCORE MOTOR.
 PULSES REPLAY S.U. COIL, THRU IMPULSE CAM SWITCH A.
 ENERGIZES LOCK RELAY.
 IN HOLD CIRCUIT TO THIS RELAY.

LOCK RELAY

IS ENERGIZED BY THE COIN RELAY OR LEFT FLIPPER SWITCH.



ENERGIZES GAME-OVER RELAY (TRIP COIL).
 6 VOLTS FROM TRANSFORMER TO LITES.
 6 VOLTS FROM TRANSFORMER TO LITES.
 IN HOLD CIRCUIT TO THIS RELAY.

On Mechanism Panel

EJECT RELAY

IS ENERGIZED BY LEFT OR RIGHT EJECT SWITCH.

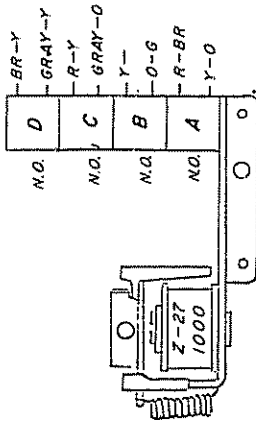
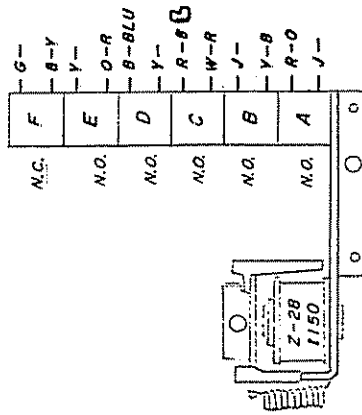


DIAGRAM LOCATION

E-16 PULSES 100 POINT RELAY, THRU CAM SWITCH 1C.
 E-12 ENERGIZES (2) EJECT COILS, THRU CAM SWITCH 4A.
 C-6 RUNS SCORE MOTOR.
 E-3 IN HOLD CIRCUIT TO THIS RELAY.

BALL INDEX RELAY

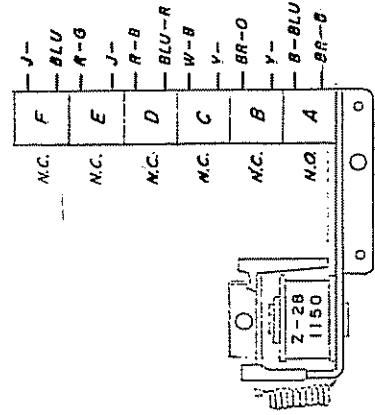
IS ENERGIZED BY THE 100 POINT RELAY.



D-10 IN CIRCUIT TO 1000 POINT DRUM UNIT DURING RESET CYCLE.
 C-15 IN SERIES WITH SWITCH "A" ON EXTRA BALL RELAY.
 C-11 IN SERIES WITH SWITCH 1A ON 100 POINT RELAY.
 E-7 IN CIRCUIT TO BALL COUNT S.U. COIL, THRU SWITCH "B" ON OUTHOLE RELAY.
 D-7 IN NUMBER MATCH CIRCUIT TO REPLAY S.U. COIL.
 E-22 IN HOLD CIRCUIT TO THIS RELAY.

EXTRA BALL RELAY

IS ENERGIZED BY 500 RELAY, THRU SWITCHES ON A, B, C AND D RELAYS

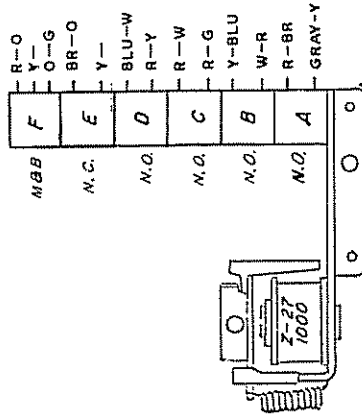


E-22 IN CIRCUIT TO BALL INDEX RELAY.
 D-7 IN SERIES WITH SWITCH "E" ON BALL INDEX RELAY.
 D-7 IN SERIES WITH SWITCH "C" ON BALL INDEX RELAY.
 C-7 TO FLASHING HORSESHOE LITES FOR EXTRA BALL.
 C-15 IN HOLD CIRCUIT TO A-B-C and D Relays.
 F-15 IN HOLD CIRCUIT TO THIS RELAY.

On Mechanism Panel

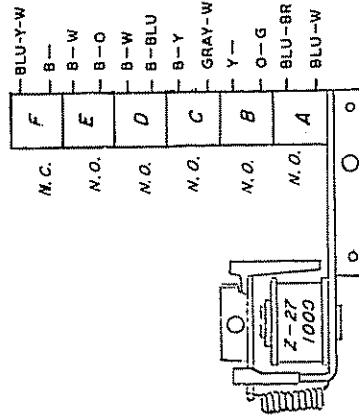
OUTHOLE RELAY

IS ENERGIZED BY OUTHOLE SWITCH,
THRU INDEX CAM SWITCH A.



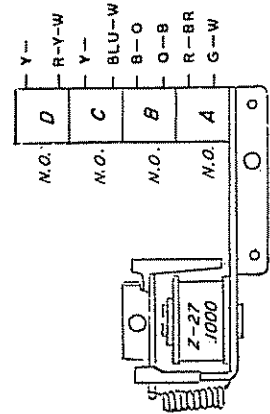
RESET RELAY

IS ENERGIZED BY THE COIN RELAY.



COIN RELAY

IS ENERGIZED BY COIN SWITCH.
ALSO BY REPLAY BUTTON WHEN A
CREDIT IS AVAILABLE.



OPERATION

DIAGRAM LOCATION
 D-22 IN SERIES WITH SWITCH "A" ON BALL INDEX RELAY.
 D-5 ALSO RUNS SCORE MOTOR.
 C-15 IN PARALLEL WITH SWITCH "B" ON EXTRA BALL RELAY.
 E-12 PULSES BALL RELEASE COIL, THRU CAM SWITCH 4A.
 E-7 IN SERIES WITH SWITCH "E" ON EXTRA BALL RELAY.
 F-7 IN SERIES WITH SWITCH "D" ON EXTRA BALL RELAY.
 E-12 IN HOLD CIRCUIT TO THIS RELAY.

G-12 OPENS CIRCUITS TO PLAYFIELD SWITCHES.
 D-11 IN CIRCUIT TO 1 POINT DRUM S.U.
 D-11 IN CIRCUIT TO 10 POINT DRUM S.U.
 D-11 IN CIRCUIT TO 100 AND 1000 POINT DRUM S.U. COILS.
 C-5 RUNS SCORE MOTOR.
 D-4 IN HOLD CIRCUIT TO THIS RELAY.

C-6 ENERGIZES RESET COILS ON BALL COUNT, REPLAY AND
 ADVANCE UNITS.
 C-4 ENERGIZES RESET RELAY.
 E-4 ENERGIZES LOCK RELAY.
 E-3 IN HOLD CIRCUIT TO THIS RELAY.

GAME-OVER RELAY
(Interlock)

LATCH COIL IS ENERGIZED BY COIN RELAY, DURING RESET CYCLE. TRIP COIL IS ENERGIZED BY BALL COUNT UNIT AFTER LAST BALL HAS BEEN PLAYED. ALSO BY TILT SWITCHES AND WHEN LOCK RELAY DROPS OUT.

On Mechanism Panel

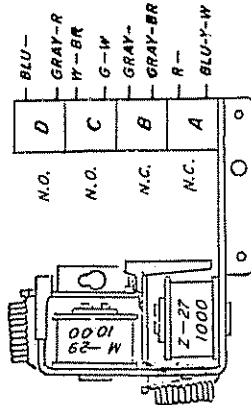


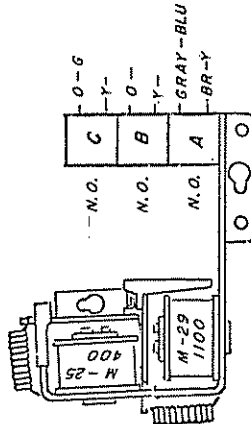
DIAGRAM LOCATION

A-5 TO TILT LITE.
E-3 IN CIRCUIT TO COIN RELAY, THRU REPLAY BUTTON SWITCH.
F-10 OPENS CIRCUIT TO REPLAY UNIT S.U. COIL.
G-12 OPENS CIRCUITS TO PLAYFIELD SWITCHES.

500 RELAY

IS ENERGIZED BY CENTER HORSESHOE ROLLOVER BUTTON SWITCH.

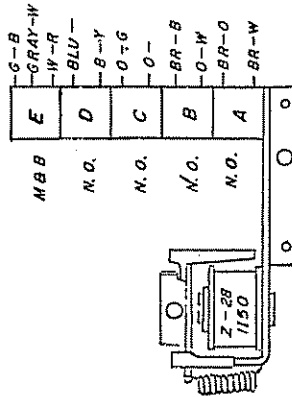
Located on Playfield



C-5 RUNS SCORE MOTOR.
C-15 ENERGIZES EXTRA BALL RELAY, THRU SWITCHES ON A-B-C AND D RELAYS.
F-16 TO 100 POINT RELAY, THRU IMPULSE CAM SWITCH "C".

"D" RELAY

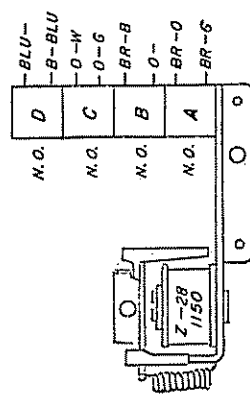
IS ENERGIZED BY "D" TARGET SWITCH.



E-18 CIRCUIT TO 10 OR 100 POINT RELAY, THRU SWITCH "B" ON NO. 3 BUMPER RELAY.
A-9 TO BOTTOM JET BUMPER AND "D" BUMPER LITES.
B-7 TO HORSESHOE LITES (FOR EXTRA BALL).
F-15 IN SERIES WITH SWITCH "B" ON 500 RELAY.
E-15 IN HOLD CIRCUIT TO THIS RELAY.

"C" RELAY

IS ENERGIZED BY "C" TARGET SWITCH.



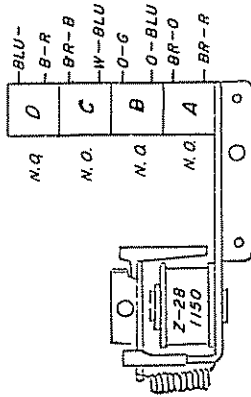
A-8 TO "C" BUMPER LITE.
E-15 IN SERIES WITH SWITCH "B" ON "D" RELAY.
B-7 IN SERIES WITH SWITCH "C" ON "D" RELAY.
E-15 IN HOLD CIRCUIT TO THIS RELAY.

Located On Playfield

DIAGRAM LOCATION

"B" RELAY

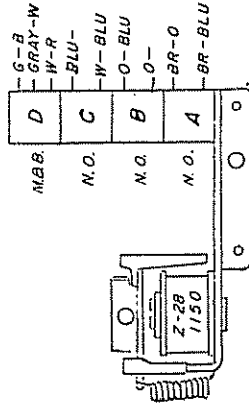
IS ENERGIZED BY "B" TARGET SWITCH.



TO "B" BUMPER LITE.
 IN SERIES WITH SWITCH "B" ON "C" RELAY.
 IN SERIES WITH SWITCH "C" ON "C" RELAY.
 IN HOLD CIRCUIT TO THIS RELAY.

"A" RELAY

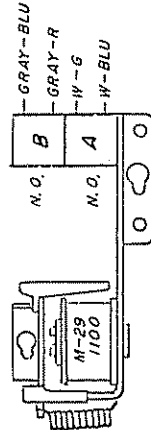
IS ENERGIZED BY "A" TARGET SWITCH.



TO 1 POINT OR 10 POINT RELAY, THRU SWITCH "B" ON NO. 1 BUMPER RELAY.
 TO LEFT AND RIGHT TOP JET BUMPER LITES. ALSO TO "A" BUMPER LITE.
 IN SERIES WITH SWITCH "B" ON "B" RELAY.
 IN HOLD CIRCUIT TO THIS RELAY.

MYSTERY ADVANCE RELAY

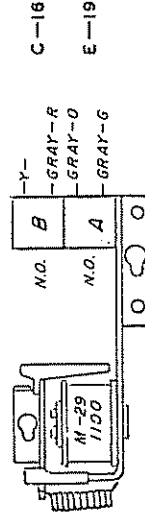
IS ENERGIZED BY LEFT OR RIGHT EJECT SWITCH, THRU SWITCH "B" ON CHANGE RELAY.



TO ADVANCE UNIT S.U. COIL.
 IN HOLD CIRCUIT TO THIS RELAY.

TARGET RELAY

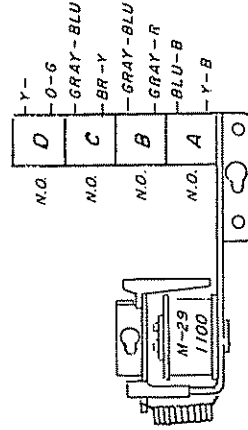
IS ENERGIZED BY CENTER TARGET SWITCH, THRU SWITCH "A" ON CHANGE RELAY.



ENERGIZES ADVANCE UNIT S.U. COIL.
 IN HOLD CIRCUIT TO THIS RELAY.

ADVANCE RELAY

IS ENERGIZED BY TOP CENTER OR BOTTOM CENTER ROLLOVER SWITCH.

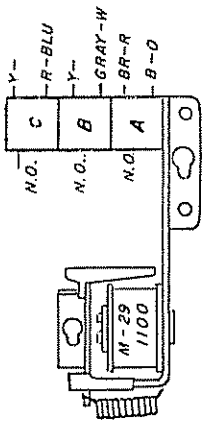


RUNS SCORE MOTOR.
 IN CIRCUIT TO PULSE 100 POINT RELAY.
 IN CIRCUIT TO PULSE ADVANCE UNIT S.U. COIL.
 IN HOLD CIRCUIT TO THIS RELAY.

Located On Playfield

No 3 BUMPER RELAY

IS PULSED BY BOTTOM JET BUMPER SWITCH.



OPERATION

PULSE BOTTOM JET BUMPER.
 IN SERIES WITH SWITCH "E" ON "D" RELAY.
 IN HOLD CIRCUIT TO THIS RELAY.

DIAGRAM LOCATION

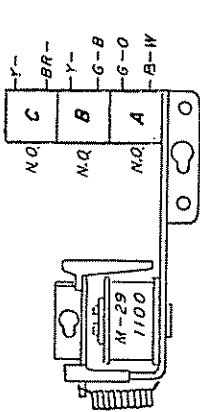
C-7

C-18

E-21

No 2 BUMPER RELAY

IS PULSED BY TOP CENTER JET BUMPER SWITCH.



PULSES CENTER JET BUMPER.

PULSES 1 POINT RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

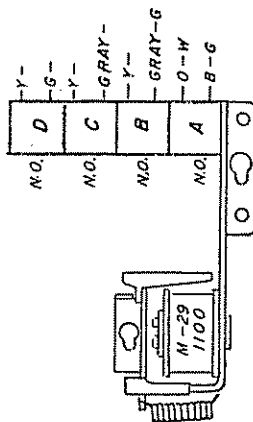
C-6

C-18

E-21

No 1 BUMPER RELAY

IS PULSED BY LEFT OR RIGHT JET BUMPER SWITCH.



PULSES RIGHT TOP JET BUMPER.

PULSES LEFT TOP JET BUMPER.

IN SERIES WITH SWITCH "D" ON "A" RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

C-6

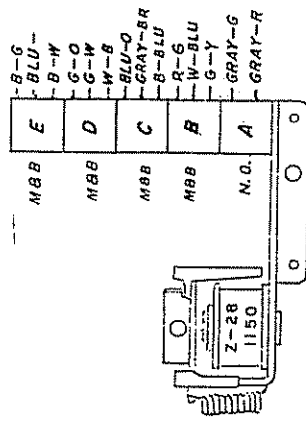
C-6

C-17

E-20

CHANGE RELAY

IS ENERGIZED BY NUMBER MATCH UNITY DISC (EVERY OTHER STEP).



TO LEFT OR RIGHT EJECT HOLE LITE. ALSO TO CENTER TARGET LITE.

TO LEFT OR RIGHT BOTTOM ROLLER "SPECIAL" LITE.

IN CIRCUIT TO REPLAY S.U. COIL, THRU LEFT OR RIGHT BOTTOM ROLLER SWITCH.

CIRCUIT TO MISTERY ADVANCE RELAY, THRU LEFT OR RIGHT EJECT SWITCH.

PULSES TARGET RELAY, THRU CENTER TARGET SWITCH.

A-9

A-7

F-12

F-13

E-19

Located In Back-Box

100 POINT RELAY

IS PULSED BY ADVANCE RELAY, 500 RELAY, EJECT RELAY, AND PLAYFIELD ROLLOVER SWITCHES AS INDICATED.

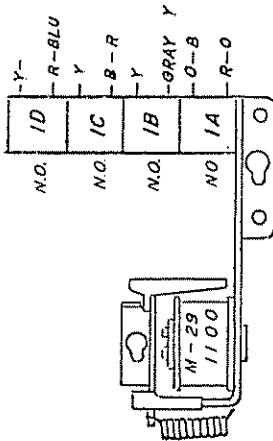
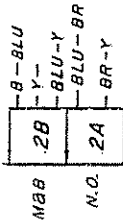


DIAGRAM LOCATION

OPERATION

OPENS CIRCUIT TO EXTRA BALL RELAY, AND CLOSES TO BALL INDEX RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

IN HI-SCORE CIRCUITS TO REPLAY S.U. COIL.

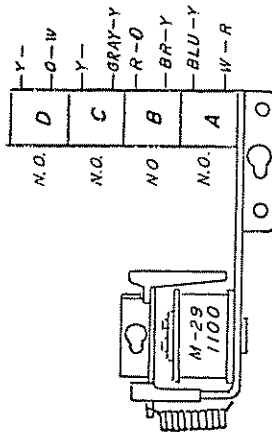
PULSES 1000 POINT DRUM UNIT, THRU 9TH. POSITION SWITCH ON 100 POINT DRUM UNIT.

PULSES LARGE BELL COIL.

PULSES 100 POINT DRUM UNIT.

10 POINT RELAY

IS PULSED BY NO. 1 AND NO. 3 BUMPER RELAYS. ALSO BY (4) TOP TARGET SWITCHES.



PULSES 10 POINT DRUM UNIT.

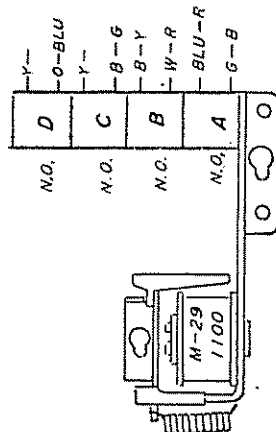
PULSES LARGE BELL COIL.

PULSES 100 POINT RELAY, THRU 9TH. POSITION SWITCH ON 10 POINT DRUM UNIT.

IN HOLD CIRCUIT TO THIS RELAY.

1 POINT RELAY

IS PULSED BY NO. 1, NO. 2 OR NO. 3 BUMPER RELAYS. ALSO BY STAND-UP SWITCHES, KICKER SWITCHES, AND (4) TOP BUMPER SWITCHES.



PULSES 1 POINT DRUM UNIT.

PULSES NUMBER MATCH S.U. COIL.

PULSES 10 POINT RELAY, THRU 9TH. POSITION SWITCH ON 1 POINT DRUM UNIT.

IN HOLD CIRCUIT TO THIS RELAY.